

# Effective Learning Environment Management through the implementation of online cooperative learning tools at Higher Schools

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## ABSTRACT

This article describes how the Internet has been used as an instrument for the implementation of the online environment in cooperative learning, to encourage the effective learning among students towards the "Occupational health and safety management in the production process" at Silesian College of Economics and Administration in Bytom - Poland. Interactions that occurred among students and between students and teachers illustrate how cooperative learning, aimed to solve the problem, can be supported by using the tool, which is Pbworks. The content of the course focuses on learning based on the use of technology, thus enabling students to enter into authentic learning environment. For the purpose of the article, qualitative and quantitative researches were used, conducted among students, which show from their perspective the benefits of creating an effective learning environment with the use of cooperative online tools Pbworks.

**Key Concepts:** Blended learning, cooperative learning, online learning environment, Pbworks.

## 1 INTRODUCTION

### 1.1 Effective Learning Environment and cooperative learning

Cooperation is a key component in the provision for the creation of "effective learning environment" ("effective learning environment"), as it gives students an opportunity to discuss, arguing, negotiating, and reflection on the current beliefs and knowledge. The pupil becomes engaged in building knowledge in the process of discussion and interaction with experts and compassion.

Collaboration and cooperation is working together to achieve common goals. Through cooperative actions, the individuals are trying to get results beneficial both for themselves and for other group members. Cooperative learning (learning based on collaboration - online cooperative learning ") is the usage of small groups for training purposes so that the students work together to achieve the best possible learning outcomes.

The idea is simple. Members of the class are divided into small groups, which receive instructions from the teacher. They work on a task until all members of the group understand and execute them completely. As a result of collaborative efforts, participants attempt to achieve a common benefit, so that all members of the group have the benefit of the efforts of others. (Your success is beneficial for me and my success is beneficial to you), bearing in mind that all group members share a common fate (Here, we either swim or drown together), being aware that the achievements of one person are caused jointly by them and by their colleagues ( We cannot do that without you), at the same time, feeling proud and jointly celebrate when one of the members of the group is honored by their achievements (We all congratulate you on your making!).

In cooperative learning situations, there is a positive correlation between the reaching the goals by the students; they realize that they achieve their educational goals, if and only if the other students from their group will also reach their educational goals. For instance, the success of the team member to create a multimedia presentation about the environment protection, depends both on their personal efforts and the efforts of other group members, who bring the necessary knowledge, skills and resources. None of the individual members of the group will not have full information, skills or resources needed for the presentation of the highest possible quality.

## **1.2 Strategies used by students in order to enable cooperative learning**

Creating a method to address each student learning experience with different technologies was a part of passing the course. They were asked to provide a set of materials relating to the subject in the form of an HTML document, available at the class website. In addition, the instructor presented a few examples of how such a learning experience can be created.

In the first five weeks of classes, the literature related to the topic in the form of class discussion and workshops available by email was reviewed - a forum and through mutual creation of website by using Pbworks. Next nine weeks were devoted to a discussion led by students. The strategies implemented by students cover precisely the content of this article.

All students were encouraged to take advantage of Pbworks after classes. 25 students used the Internet the University infrastructure, having the Internet access at work or at home. A leader responsible for the proper conduct of cooperation and interaction was appointed.

As part of the University's initiative to try flexible methods of "cooperative learning" this course was the first one which experimented with such a combination of measures. Therefore, the students were novices at this, however, they willingly and enthusiastically came up to the application of these technologies. In this way, the strategy of "cooperative learning" has become the experiment and resulted in some interesting conclusions.

## **1.3 Implementation of a cooperative environment for effective online learning**

It was decided to use Pbworks environment for the course aims, because it is simple to create and edit Web site that allows users to create pages, edit their contents, add media and comments in an easy WYSIWYG editor. It makes a team work on a mutual project easy.

Pbworks has provided our students and teacher for an easy access to a user-friendly website, serving to build community and to work outside the assembly hall. This is a great tool to easily share documents, images, audio and video, which the teacher and students find and want to share with them.

Students experimented with synchronous and asynchronous interactions on the Web, took part in the face to face classes, meetings and conferences. Website created for the purpose of the course provided information about each of the students (they were asked to provide their personal profile), related to the topic of references and a guide to the weekly presentation and access to tools Pbworks.

## **2 SURVEY - DETAILED ANALYSIS**

For the purpose of examining the impact of the application Pbworks on cooperative learning among 25 participants of classes towards "Managing occupational health and safety in the production process" a survey entitled "Application Pbworks in education at the Higher School of Economics and Administration in Bytom" was conducted. It included both quantitative and qualitative study.

### **2.1 Description of the survey**

First, respondents filled the column called "metric". In addition to general questions about sex, place of residence, type of employment and age, in this part students were also asked how many years they had been using the computer.

Another part of the survey concerned the assessment of specific skills related to computer and the internet service. Respondents had a five-grade scale at their disposal (1 - I cannot, 2 - little experience, 3 - I use occasionally, 4 –a regular user, 5 - experienced and may explain others) on which they answered the questions about specific skills grouped into five themes: computer use, computer hardware support, writing, Internet and e-mail. Then, the surveyed identified, what equipment they have an access at work or at home (computer, printer, scanner, etc.).

The last part of the questionnaire was focused on the tool, which is Pbworks and evaluation of its use by course participants. Thus , it was possible to obtain information on how members of various teams communicated among themselves in order to create a common website. On a scale from 1 (very easy) to 5 (very difficult) the respondents also rated the difficulty of creating a page with the usage of Pbworks. Next, they had the opportunity to express their opinions on traditional and modern methods of learning and cooperative learning. They assessed, whether the study with using online tools helps in the assimilation of knowledge, how, what are the advantages of using modern methods and the traditional ones.

At the end of study analysis, the authors of the article present the detailed results of the assessment schedule (during which the presented methods were used) made by the students.

### **2.2 A user profile**

The questionnaire was completed by a total number of 25 people. There were slightly more women (14). All people live in the city. The majority of respondents are full-time employees (15 people), eight people are unemployed and two are part-time workers.

The average age of respondents is between 19 and 30 years (21 people), three individuals are over 30 years old, and one is over 40.

Most people have already extensive experience in computer use, nine people have been using it regularly for over ten years, the same number of people have been doing it a bit less (from 7 to 10 years). Four people have experience in this field from four to six years, three shorter: between two and three. But nobody in this group is a computer novice, because no one pointed out that has been using this device fewer than one year. This information is shown in the chart No. 1

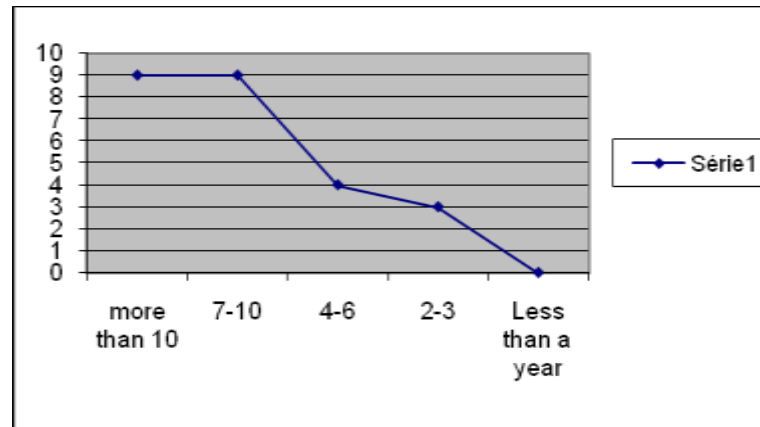


Figure 1 Practice in computer use, presented in years

### 2.3 ICT Skills

Generally speaking, the respondents have high skills of using new information and communication technologies (ICT). Almost in each of the areas listed in the poll, the average skill was more than 4 (where 4 is the "constant users" and 5 is "an experienced and can explain the others").

Respondents definitely deal with the mail service the best (Figure 2). In the category "E-mail", the average response was up to 4.8, while, remember, 5 is the highest note, which the respondent could imagine. They are either regular users or they can explain others almost any of the following skills in this area, the lowest selection - I occasionally use – was marked only by one person, in case of sorting and file messages in folders. This ability, taking into account the obtained average, seems to be also among others, related to e-mail, the most complicated.

Sending and receiving messages, opening and saving files attached to received messages, the transmission of messages to selecting contacts, creating new contacts in their address book received the highest marks. Extensive experience in this field shows that respondents often use the Internet for communication.

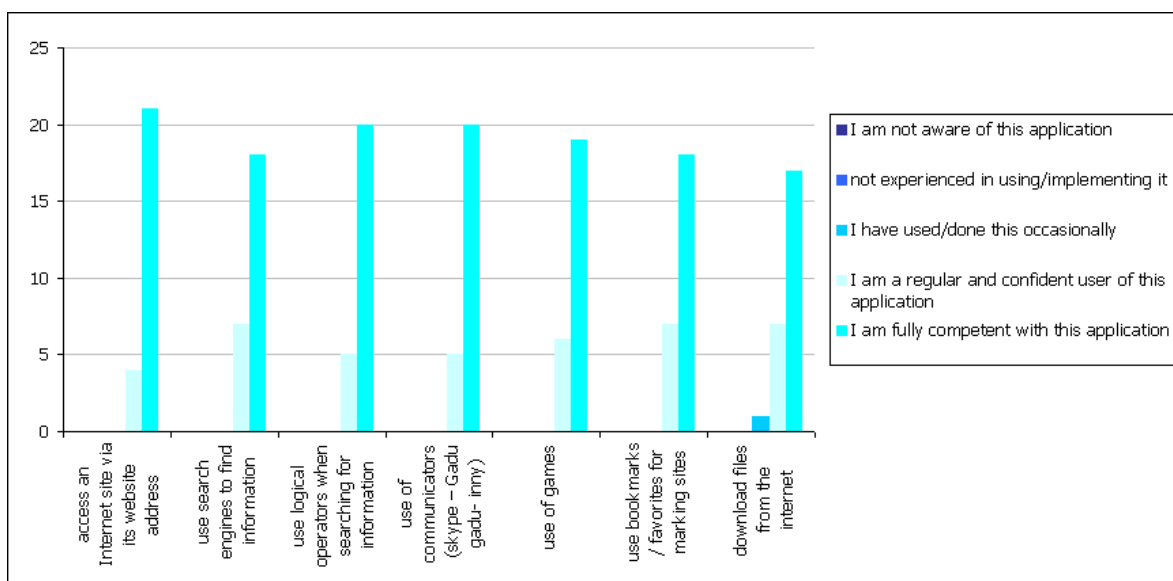


Figure 2. E-mail

It is also proved by a high note for the use of instant messaging (Skype, Gadu-Gadu, and others) - 4.5. This ability is assigned to "the Internet" – the competence in this area was rated the high by respondents, in total of 4.4 (Figure 3). the easiest is the use of search engines to find information (4.7; seventeen experienced people). Though the use of logical operators while searching process, poses major problems (4.2), and five people do occasionally use this option. Gaining access to the Internet via a website address, respondents overall rated the 4.6, but there is already one answer "cannot" or "I use it occasionally. At a similar level there are the skills of downloading files from the Internet, saving text and graphics from web pages, or use bookmarks / favorites to select pages (all at 4.5). The latest indicates a higher level of involvement in the online world – because of this option, the Internet users, "get acquainted with it," choosing from its vast resource, that information which meets their specific needs and they customize it. However, this possibility is used occasionally by five people, and seventeen of them are experienced and can explain it to others.

It seems to be quite interesting that the interviewed have the slight experience in the use of games via the Internet (average 3.6). Although still the largest selections were recorded in response to "an experienced and can explain the others" (10 people). However, up to eight people occasionally use this function (the largest number of selections of the options in this section), four have little experience in this field, and one in general cannot use this option at all. This may mean that the purely entertaining function of the Internet is the least interesting, and definitely information and communication advantages seem to be more interesting.

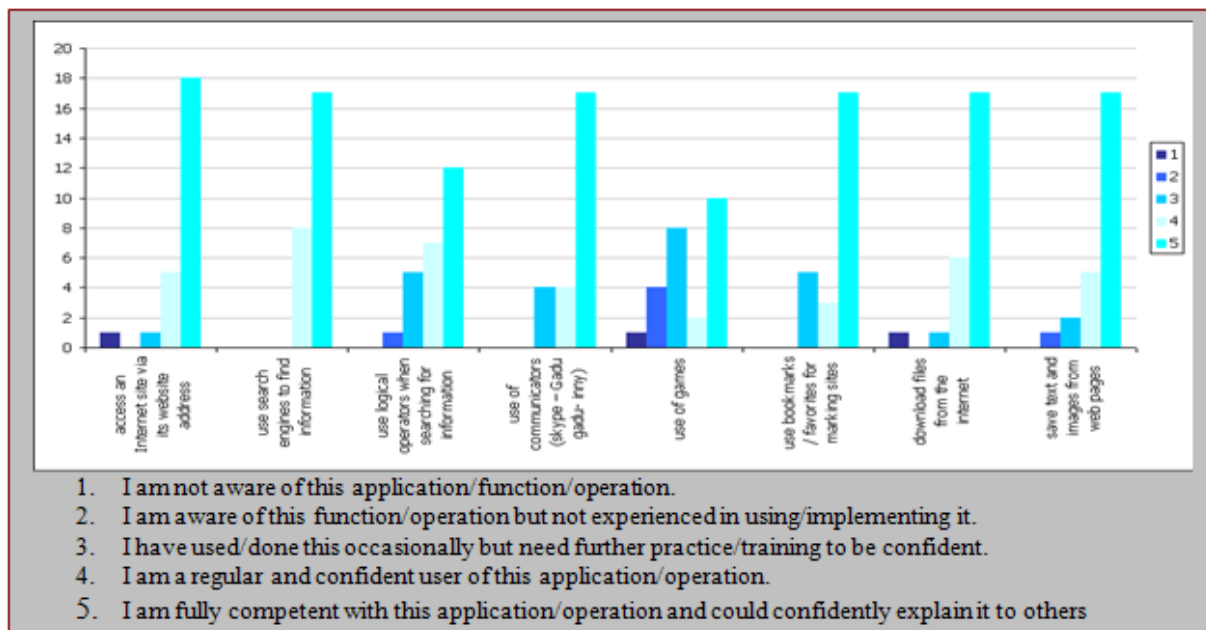


Figure 3 . Internet

In general computer use (Figure 4) the respondents are such experts as in the use of the Internet (average 4.4). Managing files and folders and searching for files on their computer (average 4.6) turned out to be the best in this case, - the responses "use regularly" or "experienced and can explain to others." were only marked . Moreover, moving and copying files between drives is not a problem. Only the situation with CD-ROM and backing up files on various types of media (4.5 each), and locating and running the program (4.4) looks slightly worse . Using tools such as Excel, MSOffice package (average 4.0) and Powerpoint (only 3.8) looks the worst. Only in the latter case, the answer "little experience" was stated (three people) - the lowest of all in this section.

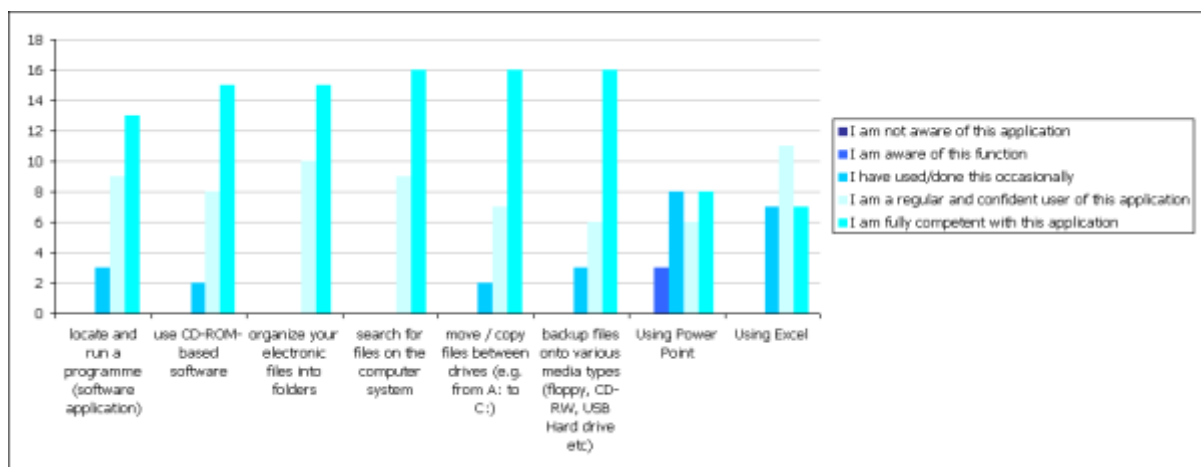


Figure 4 . Computer use

Writing on the computer (Figure 5) is another competence analysis, only slightly less developed than the previous ones (average 4.3). Respondents have mastered all these skills in this area, but at varied degrees. Definitely the use of simple editing, such as bold, italics, centering, fonts, etc. turned out to be the best (4.8): there are up to nineteen experienced people, 76 percent., who may explain those functions to others. Use the AutoCorrect (three people find this occasionally, and the overall average was 4.5) and the import of text and image to a text document (4.5) look a bit worse. Next in line are: inserting tables into the document and laying out the text and image (at 4.4). Next comes the division of page into columns and creating new document templates (4.3 each). Using templates for standard documents, gained an average 4.2, as well as the use of headers and footers, and use of tools for drawing and creating shapes. The lowest notes consist of : saving documents in different formats including HTML (the average 4.0; most responses indicated " I use it occasionally " - five) and mail merge (average 3.9, four people have little experience or occasional use this option ).

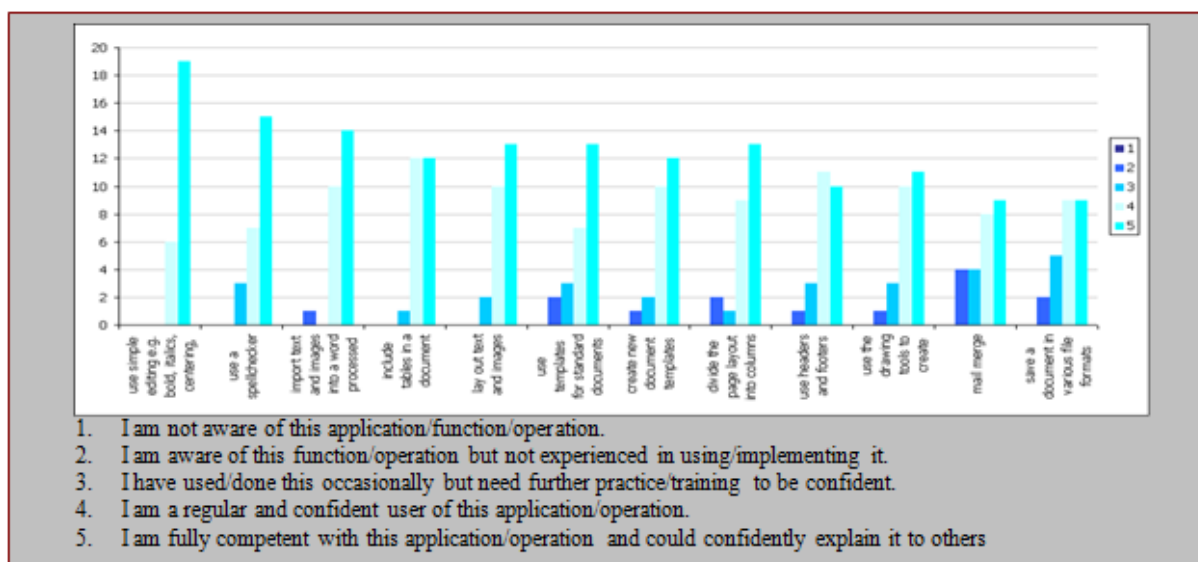


Figure 5. Word Processing

Definitely the worst, and with a big difference to other divisions ,using of computer equipment (average 3.8) turned out to look the worst, which shows a graph No 10. There were a lot of response "cannot": use a scanner to capture a text (OCR), digital camera for capturing moving images, multimedia projector. These three skills acquired also the lowest general note, using the projector looks the worst (only 3.2). This is certainly due to the fact that these skills are connected with having access to the specific device technologies. The ability to connect your computer and peripherals, which appears to be the basic skill, was presented quite poorly in the survey. Using the scanner to copy pictures (4.0), and finally using a digital camera to capture images (4,1) obtained the highest scores. This is not surprising, taking into consideration a photography as a popular hobby. Respondents rated their knowledge of safe computer use, copyright and law (4.0) and the principles of health and safety relating to the computer environment (4,1) relatively high. Nevertheless, it pays



attention to the fact that the level of knowledge about these basic principles is much lower than the practical use of the computer and the Internet.

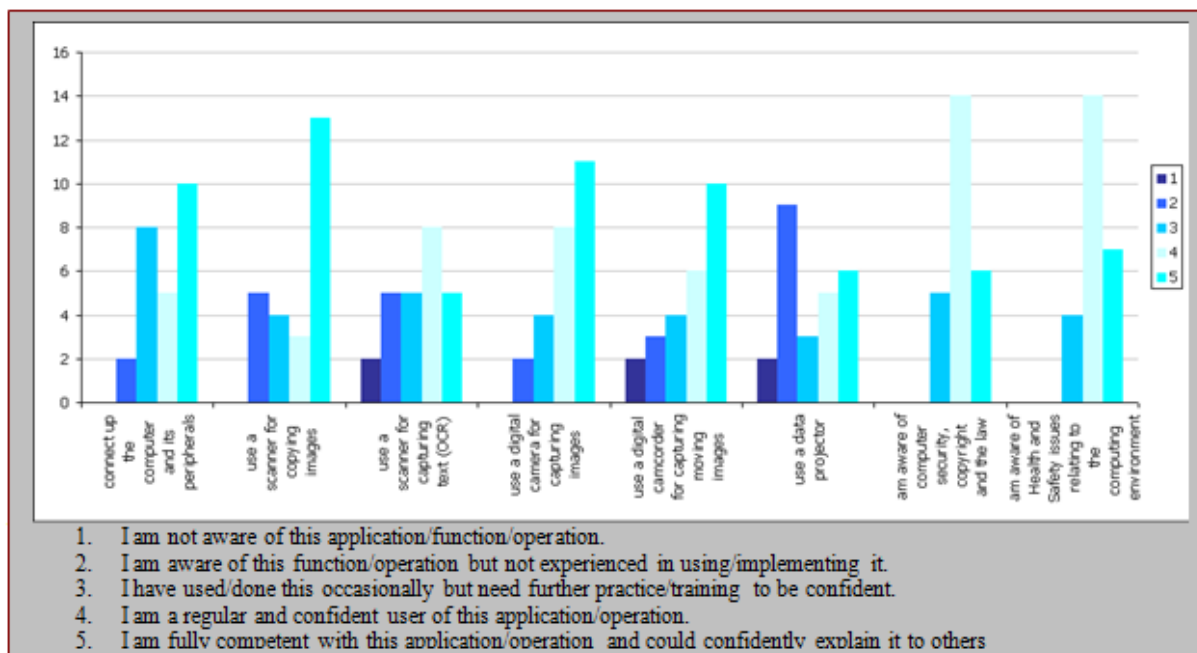


Figure 6. Computing hardware and environment

These responses are consistent with the results of the next survey on the access to the various technologies at homes or at work (Figure No. 7). 15 people do not have the access to the multimedia projector and the interactive tables 21 people. Graphics software (available to twelve people) or software for Web publishing (nine people have access to it) are also quite rare. This fact shows that the experience of creation of a website could be an interesting novelty and useful experience for the students. Quite a lot of people (twelve) do not have the access to the transparencies into the printer / copier. Besides, the majority of equipment is widely available, putting them from the most accessible, we obtain the following sequence: the Internet Access, Office, computer, laptops (one negative selection), printer, video camera / the internet, CD burner, scanner ( four people do not have the access to it), access to the Intranet and digital cameras (there are six people without the access to them).



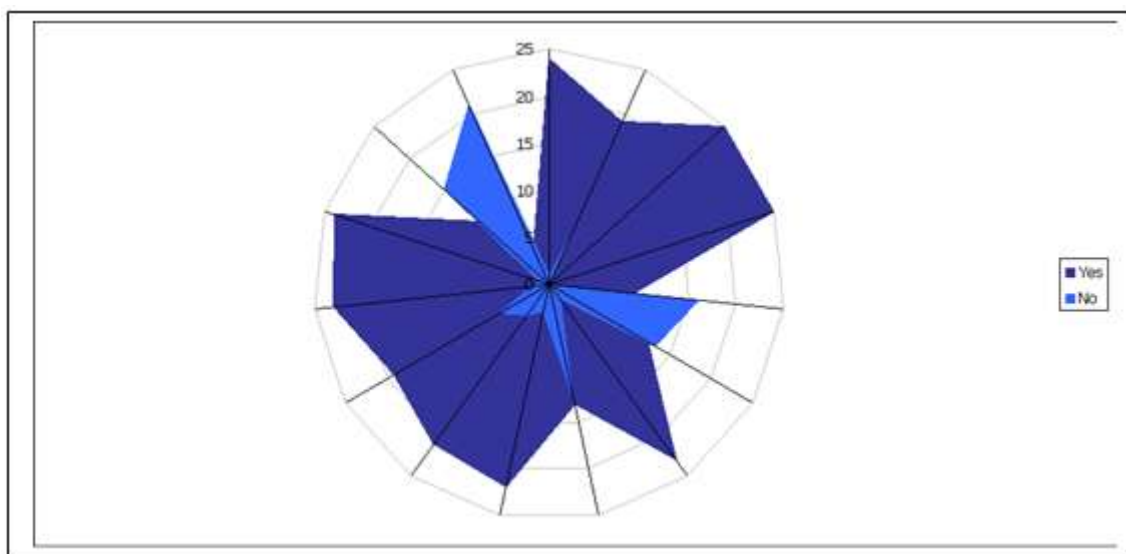


Figure 7 Access to different technologies at home / work

## 2.4 From the different perspectives

A conducted survey can be examined, assuming a variety of filters, which will gain a few valuable conclusions.

By limiting the analysis of the survey only to men (eleven people), we find that almost all of them are full-time employees (one person does not work), nine of them are between the ages of 19 to 30 years, but their experience in using the computer is varied: six of them have more than ten- years experience, three of them slightly shorter, and the two only two, three – year experience.

On the other hand, out of fourteen women, half of them do not work, five are full-time workers and two part-time. Twelve of them are between the ages of 19 to 30 years. Surveyed women use the computer shorter than men: half of them have seven to ten years experience three of them have a longer experience, while three have been using a computer regularly from 4 to 6 years.

Differences in experience are reflected in the level of ICT skills. Men slightly better deal with the internet (4.5 compared to 4.3 of women), use of an e-mail (4.8 compared to 4.7 of women), general computer use (4.4 compared to 4.3 of women), much better with the use of hardware and environment (4.1 compared to 3.5 of women). However, women mastered better writing (4.5 compared to 4.1 of men). This confirms the use of a filter to the polls in the form of experience, without distinction of sex: the skills typically grow with practice.

## 2.5 Pbworks tool assessment and cooperative learning

Another part of the survey was intended to show how participants perceive the tools they were using during the classes, and how they evaluate the kind of learning which is learning through collaboration, in this particular case, using the Internet for this purpose and the ability to create the mutual website .

The authors of the questionnaire decided to check how the participants contacted with one another, forming together a website (Figure 8). As it turns out, the most common means

of communication was the phone, not the Internet. Although the task was to work in the online environment. Up to 21 people pointed out that they often had contacted by phone. This means that the respondents still have greater confidence in a more direct contact. The phone is a tool that saves time, because it does not involve traveling in space. The same feature can be attributed to the Internet communications. The phone probably wins because of a greater convenience of use: it provides 24 hours a day communication, as the Internet may still not be able to provide us with , it offers a better quality of contact (email and free instant messaging clients require typing, in turn, conversations over the Internet are far lower quality than the phone).

However, the network is not less popular. Nineteen people often used the e-mail. Adding to the fact that twelve people also often contacted via instant messaging, it can be seen that the Internet is superior thanks to the diverse ways of communication, and probably also due to the lower usage costs. The prevalence of e-mail is not surprising, especially taking into account the results of the previous part of the survey, where their skills related to e-mail were rated the highest by respondents. In turn, IM seems to act as an additional, but also an important communication tool. Interestingly, the most answers "never" appear in this case - nine people have not benefited of this form at all , which also wonders, taking into consideration the fact that the task was performed via the Internet. As for the meetings, most people (fourteen) answered that they contacted in this way occasionally, which can be explained by the desire to save time - further results of a survey confirms that.

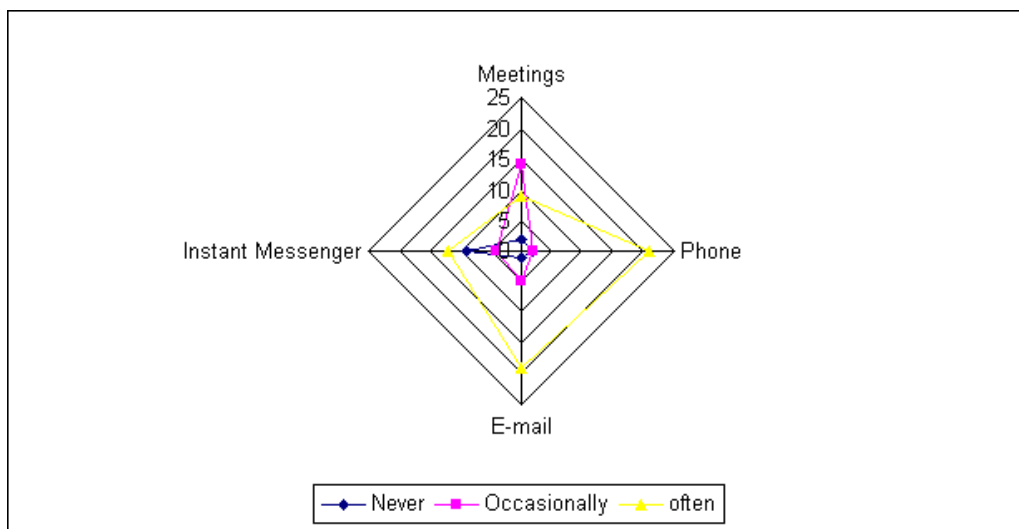


Figure 8 Forms of communication while creating a Pbworks page

Another test case, associated with the activities specificity, related to the degree of difficulty to create a website using Pbworks (Figure 9). The most popular (nine) selections were "very easy", which confirms that the majority of respondents have high computer skills. For seven people a task was easy. But the same number of people considered it to be difficult, and even one very difficult, which in turn shows that some skills in this area are worth training. But what is important that over a half (64 percent) of respondents found Pbworks to be easy to use. It means that it has fulfilled the role entrusted to it, and can be successfully used as an additional and interesting teaching tool.

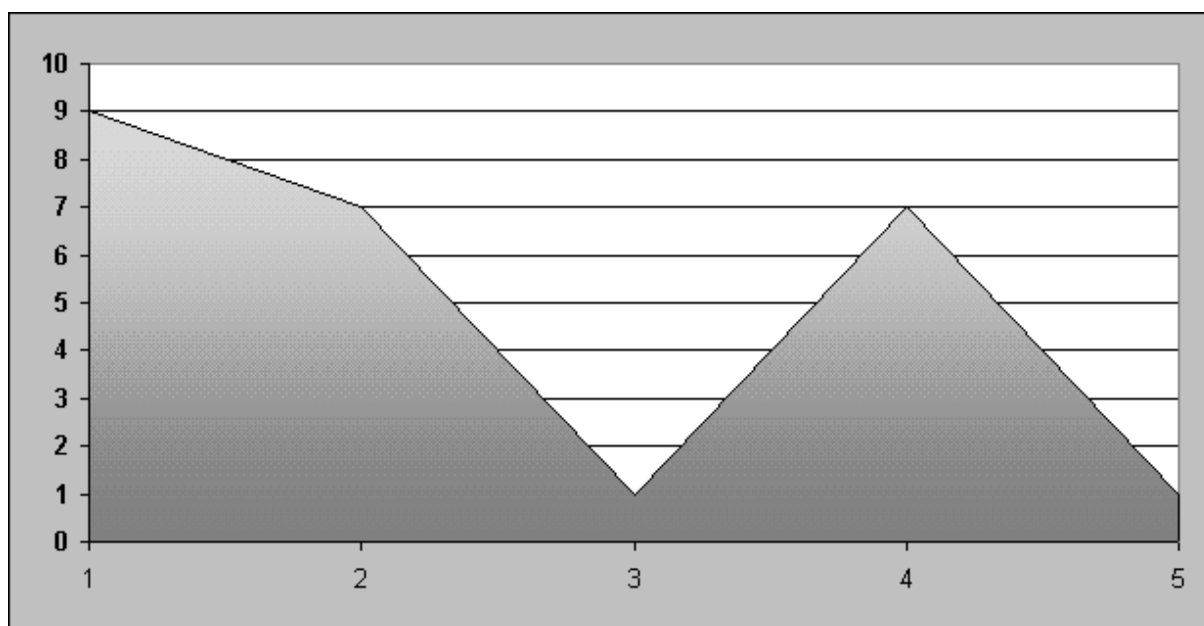


Figure 9 The degree of difficulty assessment to create a website using Pbworks 1 (very easy) to 5 (very difficult).

What is more, as many as 21 people (84 per cent of respondents) considered that this form of learning, by creating a website in teams, helps in the assimilation of knowledge (four people did not agree with this statement), which is illustrated on the following figure number 10

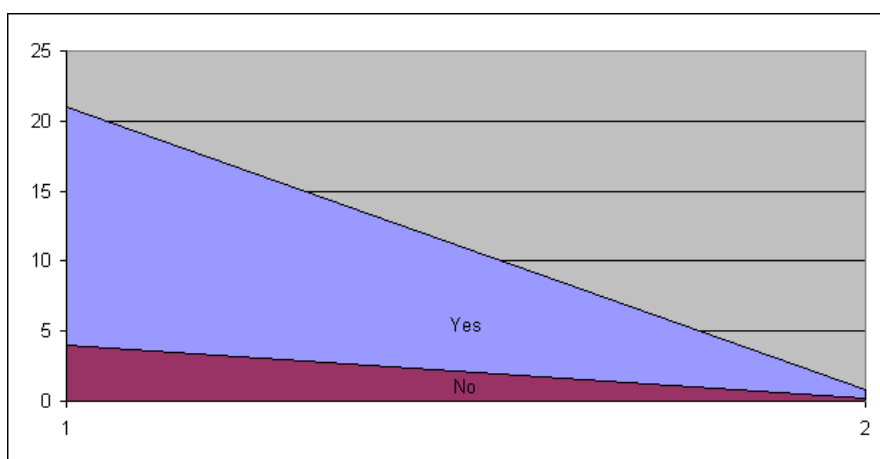


Figure 10 Assessment of the suggested form of learning in terms of impact on its acquisition.

When asked about the details ( "how?"), the surveyed mostly paid attention to aspects of communication (eleven people) : they pointed out the opportunity to use regularly the communicators ,they found that "online communication enables improvement of work" or "accelerates the acquisition of information" . Respondents value the opportunity for consultation and exchange of information . Generally speaking, the possibility of contact with the larger group, which "teaches the teamwork." One of the people even considered that this form of learning "helps in interpersonal integration. The author of the most extensive response focused mainly on the positive aspects of "reciprocal teaching", expressing its major

advantages:’ Such a method enables the exchange of information, a mutual complement of each other's knowledge. Mutual notes editing, requires preparation and commitment of the entire group, you can create a transparent database of information and teaching materials. This form tends to initiate discussions and exchange of views. It teaches assertiveness and freedom of expression’. It follows that the Internet fulfilled the communication features, supporting the cooperative learning, which, in turn, the students highly appreciate, and recognize its impact on the development of various skills.

Students quite often pay attention to the reciprocity of relations, which is also expressed in mutual assistance and learning from each other. This aspect of cooperative learning was emphasized by three people. The suggested activities allowed in this context to produce additional activities value, which is clearly expressed by the opinion: ‘People who have more knowledge and experience can help people without any experience to know the secrets of creating web sites by correcting their mistakes and pointing out a better solution’.

At the same time, students value the possibility of gaining new skills related to ICT, such as the creation of web pages - this class asset has been shown by seven people. One of them drew the attention to the positive characteristics of the Pbworks tool: ‘very easily accessible to the program, allowing the use of multiple applications, it enables to paste from other source and the availability to many other works’. This last remark is especially worth highlighting - through the creation of web pages on assigned topics, related to the subject, as a result, students have the access to the full range of material, developed in an interesting, accessible way.

The Internet Information function, which was noticed by five people, is perceived by the respondents through the prism of the communication function, reciprocity, which can be expressed by the opinion: ‘teamwork accelerates acquisition of information.’

It is worth noting that a website creation was described as the paper by one of the respondents - because in fact, it is a report, but with a modern, interesting layout. Expressed by one of the respondents view that ‘you should find information and extract from them what is the most important. Thanks to that, we repeatedly draw attention to what is in our text, even after its completion’ can be also successfully said about the paper. We must recognize the diversity of modern forms of this kind of "paper" as one person noted: ‘It forces me to use different forms: books, publications, the Internet’. The fact that it is "change", "new experience", which in effect "inspires creativity" was pointed out by few people, but these remarks about the content are considered to be very important.

Responses to another question once again strongly confirm usefulness of the Internet application in teaching in the suggested form, and cooperative learning. As many as 24 people (96 per cent of respondents) considered that new information and communication technologies in education are worth using (Figure 15). Only one person voted strongly for the use of only traditional teaching methods, arguing that in this case one spends more time on studying, in the meantime has a chance to go to the library and look through the books. On the other hand, saving time was the argument used by the advocates of ICT in teaching.

Each of the respondents was supposed to pointed out the two advantages of such an approach, hence 48 responses were obtained, however, six of them are unclear. For 42 answers, it was highlighted seven times that the time savings is important. The same number of people appreciated the benefits of communication. However, more people (nine) have recognized the advantages of information - access to information / knowledge, the possibility of its transmission.

Respondents also appreciated the opportunity to learn at home. This aspect was pointed out of by four people, justifying that it is important for people living far from school

and working, or the ability to adapt science to their own abilities and needs. A lot of people (twelve) as a benefit of such activities also mentioned the acquisition and development of ICT skills, which appear in this context as universal, useful in many different aspects of life. There were also a few very general answers, which shows that some surveyed treat ICT skills as very important and they significantly depend on them ( "they make life easier," "they stimulate thinking").

One person pointed out that one of the advantages is helping the others. Another drew attention to the fact that teaching by using new technologies is interesting, so you can acquire more knowledge, it corresponds to the replies to the previous question, where there was an opinion about stimulating creativity.

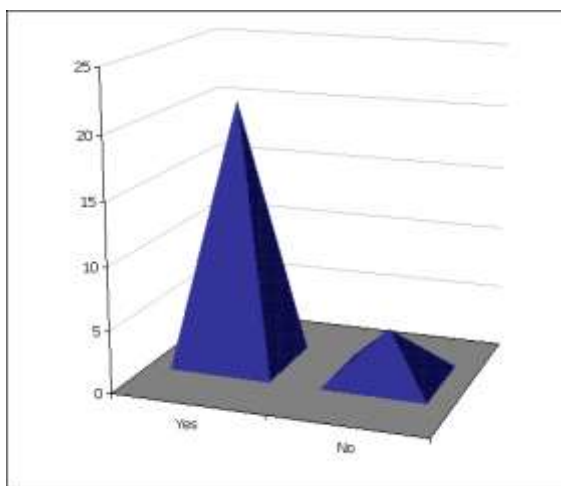


Figure 11. Evaluation of the usefulness of ICT in teaching different subjects.

## 2.6 classes evaluation

Results of the activities evaluation of major 'Managing occupational safety and health in the process of production' carried out in the form of a survey ,confirm all these observations. Most of the students assessed the difficulty of the subject as a moderate (11 people) or high (7 people). Inversely proportional the results of requirements for students are assessed (high - 12, moderate - 6). Students also gave only positive responses (most of them 'definitely yes') to questions about whether the classes gave an opportunity to master the material, or if the applied form of the exam was appropriate and whether the lecturer is able to catch the students' attention (their preparation for classes, communication, teacher competence and their impact on the image of the University was also very highly appreciated). Students admitted that all the marks were fair, and the relationship between students and teachers was direct. All these responses enable to claim that a used combination of methods of teaching - cooperative learning using new technologies - in the case of carried activities and has been a success and can definitely be recommend as an effective cooperative learning online environment.

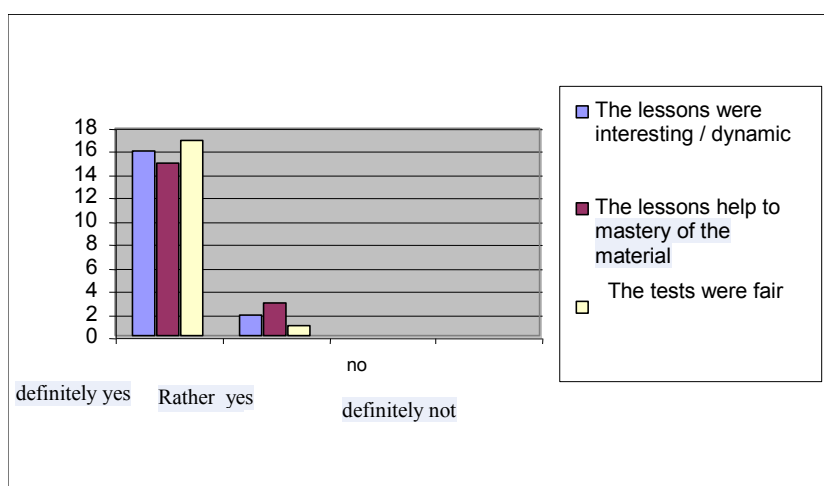


Figure 12 Students' assessment of safety and technology activities.

### 3 CONCLUSION

The study shows that the tool, which is Pbworks effectively fulfills its role in cooperative learning environments.

As it results from the study, respondents viewed the Internet mainly through its communication function, which is of great importance in the case of cooperative learning, and seems to interact well with it. Moreover, its practical benefits have also been often highlighted by the respondents, as well as saving time or opportunity to learn at home.

Generally speaking, the respondents have a high level of ICT skills, which allowed them to carry out the task of using the Internet and computer tools without any difficulties. Communication via the Internet is not a problem for them, they can operate a computer using the tools to write. They feel a little less confident in using Excel spreadsheets and PowerPoint presentations or serving more specialized equipment (eg data projector).

Some answers to open questions suggest that the task of creating a website did not come to everybody with the same ease. Altogether 64 percent of respondents rated the Pbworks as an easy tool to use. However, in majority, the difficulty of the subject was considered moderate, but also too difficult (it should be remembered that this also applies to the substance of its contents - Health and Safety), and the requirements were assessed by majority of students as too high. But in this area, less experienced people could rely on their classmates' help, acknowledging at the same time one of the assumptions of cooperative learning (your success is beneficial for me and my success is beneficial for you), which was also noticed by learners themselves.

Respondents listed a lot of positive aspects of learning through collaboration, this "reciprocal learning" and learning the course content through the use of ICT and the combination of both methods. Additional generally developmental skills were also recognized as being useful, they could be developed through these methods: concerning ICT and the creation of a website (especially since, as it has been shown by the test, software for Web publishing is very rare among respondents), or, for example, assertiveness. Comments on the interesting, attractive form of learning, makes it easier to acquire knowledge, and the



suggested form of learning has stimulated the creativity of students are also very important here. The latter observation corresponds with the current trend in teaching, the essence of which is the transition from teacher-oriented system to a student-oriented system, the transition from teaching to the learning system.

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